15 JUN 1965

MEMORANDUM FOR: Executive Director - Comptroller

THROUGH : Deputy Director for Science and Technology
FPBC

SUBJECT : Action Memorandum A-444; ADP in CIA

Transmitted herewith is a report prepared in response to your Action Memorandum A-444. Committee members included:

[redacted] 25X1

The DD/S&T member did not concur in the Committee's report. His statement of dissent is attached.

For the record, the Committee met 12 times, visited NPIC, RID, OCS, and were briefed on those operations.

I wish to commend each and every Committee member for the positive way he approached the discussions. Despite honest differences of opinion, the forum provided an excellent base for improving mutual understanding and clarifying the basic ADP issues which face the Agency.

[redacted] 25X1

Chairman
ADP Committee

cc: All Members ADP Committee
DD/S&T
FPBC

A REPORT ON AUTOMATIC DATA PROCESSING IN CIA

Prepared in response to Action Memorandum No. A-444, dated 26 March 1965

Prepared by the CIA ADP Committee
15 June 1965

TABLE OF CONTENTS

I. DEFINITION AND SCOPE OF ADP

A. Government-Wide Terms of Reference:

The Executive Office of the President has furnished a definition of the term automatic data processing and identified the scope of automatic data processing activities in terms of equipment involved:

1. The Automatic Data Processing Glossary, provided by the Bureau of the Budget in December 1962, defines ADP: "data processing performed by a system of electronic or electrical machines so interconnected and interacting as to reduce to a minimum the need for human assistance or intervention."

2. Bureau of the Budget Circular A-54 dated 14 October 1961 (referenced in BOB Circular A-71, 6 March 1965) states that ADP Equipment (ADPE) affected by the policies stated therein includes:

   a. "Electronic digital computers, irrespective of use, size, capacity, or price;

   b. "All peripheral or auxiliary equipment used in support of electronic computers, whether or not cable-connected and whether selected and acquired with the computer or separately;

   c. "Punched-card equipment, whether used in conjunction with or independent of an electronic computer; and

d. "Data transmission or communications equipment that is selected and acquired solely or primarily for use with a configuration of ADP equipment which includes an electronic computer.

"Analog computers are covered only when computers of this type are being used as equipment peripheral to a digital computer."

"Items of ADP Equipment that are (a) physically incorporated in a weapon, or (b) manufactured for the Government under a developmental contract, are not affected by the policies stated /therein/."

B. CIA Definition and Scope of ADP:

1. The ADP Committee accepted and expanded the broad definition of ADP which is given in A 1, above.

2. The Committee agreed that, for the purpose of this study and foreseeable planning, the definition of ADP and scope of ADPE given in A, above, be expanded to include microfilm-based document retrieval systems such as aperture cards and Minicard, the use of special hardware such as the WALNUT film handling devices and Automatic Language Processing (ALP) equipment, automatic communications switching control systems, and analog/digital data processing equipment.

3. Present ADP activities in CIA cover a very broad range of applications. These include extremely large document control and information retrieval systems, many types of intelligence data manipulation, statistical analysis, communications support, security records handling, the broad range of administrative data management, and the most advanced mathematical and scientific computing. It is obvious that the initial achievements the Agency has already realized through automatic data processing are but stepping stones to the future and that the range and extent of ADP activities will be greatly increased.

II. GOVERNMENT POLICY ON ADP

A. The Clewlow Report:

1. In a letter to the leaders of Congress, dated March 2, 1965, the President endorsed the suggestions for improvement in governmental ADP activities which are contained in the February 1965 REPORT TO THE PRESIDENT ON THE MANAGEMENT OF AUTOMATIC DATA PROCESSING IN THE FEDERAL GOVERNMENT (Clewlow Report).

2. The Clewlow Report identified some of the major ADP management problems:

   a. Diversity of ADP equipment and its use under varying circumstances.

   b. Great range of computer applications.

   c. The tremendous effect of system design.

   d. Coordination of research efforts.

   e. Contractor use of computers.

   f. Effect of computers on Federal employment.

   g. Selection of equipment.

   h. High cost of computers.

   i. Contracting for computers.

   j. Rental vs. purchase.

   k. Disposal of excess equipment.

   l. Equipment maintenance.

m. Data interchange.

n. Assignment of appropriate roles to the echelons of management.

3. This Government Report outlined actions which should be undertaken by BOB, GSA, etc., to provide for better Government-wide and intra-agency ADP management, such as:

a. The establishment of an ADP equipment classification system.

b. The development of criteria for evaluating the effectiveness of ADP systems.

c. The development of master data processing plans at appropriate agency levels.

d. The development and application of ADP cost principles.

B. Executive Directives:

1. Over the past five years numerous letters, bulletin, circulars, etc., which relate to ADP management and activities, have been sent to the heads of executive departments and establishments. (The Clewlow Report explains some of the difficulties in applying these guidelines and directives to particular ADP requirements.)

2. BOB Circular A-71 was issued in March 1965, following the Clewlow Report, to set forth specific Government-wide ADP responsibilities of the Bureau of the Budget, General Services

Administration, Department of Commerce, Civil Service Commission, and the ADP responsibilities of the heads of executive agencies.

At the same time, the Director of the Bureau of the Budget reminded agency heads of the Government ADP policies and guidelines set forth in the following:

a. BOB 60-6: Studies preceding the acquisition of ADP equipment (March 18, 1960).

b. BOB A-54: Policies on selection and acquisition of automatic data processing equipment (October 14, 1961).

c. BOB A-61: Guidelines for appraising agency practices in the management of automatic data processing equipment in Federal agencies (August 3, 1963).

d. BOB A-55: Annual reports on the utilization of automatic data processing equipment (November 15, 1963).

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e. BOB 64-9: Establishment of an Experimental Computer Sharing Exchange and Computer Service Center at the National Bureau of Standards (January 2, 1964).

f. Department of Commerce (NBS) letter: Plans for Operation of Experimental Computer Sharing Exchange and Computer Service Center (January 17, 1964).

g. GSA Reg. 36: Utilization Screening of Government-owned and -leased Electronic Data Processing Equipment (April 17, 1964).

h. BOB A-27: Policies and responsibilities on the sharing of electronic computer time and services (June 15, 1964).

i. GSA Temporary Reg. A-1: Government-wide automatic data processing sharing program (November 27, 1964).

C. Proposed Legislation:

1. HR 4845 (Brooks Bill) and S. 1584, 89th Congress, 1st Session, have been introduced "To provide for the economic and efficient purchase, lease, maintenance, operation, and utilization of automatic data processing equipment by Federal departments and agencies." Both bills provide a basis for the Agency to obtain an exemption from their scope on the basis of administrative action.

2. The basic objectives of the proposed legislation have been endorsed by the Agency. However, a letter from the DDCI to the Chairman, Committee on Government Operations, House of Representatives, dated 8 April 1965, pointed out that existing legislation provides "..., That the Director of Central Intelligence shall be responsible for protecting intelligence sources and methods from unauthorized disclosure;...." and requested statutory exemption for the Agency.

3. It is expected that legislation will be enacted to establish clearly Government-wide and intra-Agency responsibilities and authority in the field of automatic data processing. Meanwhile, this Agency is engaged in clarifying its own ADP structure and strengthening ADP management.

4. Hearings on S. 1584 have not yet been held in the Senate. Hearings on HR 4845 have been concluded in the House and are to be published soon. The Committee Report on HR 4845 is still being assembled, and while it is not contemplated that the Committee will accede to the Agency's request for a statutory exemption, it is expected that the Report will acknowledge our unique problems and indicate that the Agency clearly falls within the purview of the administrative exemption provision in the bill.

III. ADP DEVELOPMENTS IN CIA

A. Punched Card Data Processing:

Punched card data processing and information systems have a significant role in CIA's history. The Intellofax System (DD/I-OCR) for library document retrieval was one of the first (1947) major ADP operations of its kind. In Fiscal Year 1959 there were fourteen punched card units in the Agency.

Unit	Principal Function
MRD (Compt.)	Payroll and finance
OCR/MD	Document control
OCR/IR	Document control
OCR/BR	Document control
OCR/SR	Document control
OCR/RSB	Document control
NPIC	Report generation
RID	Document control
Staff D	Document control
FE	Document control
OO/C	Management data processing
OTR	Statistics
OS	Statistics
OC	Statistics

B. Introduction of Computers:

September 1957: The first computer was installed in the Agency. This was an ALWAC III, installed at NPIC for scientific computing.

October 1959: The first general purpose computer was installed. This was an IBM 650 RAMAC installed in RID, an initial phase in WALNUT.

October 1960: The RCA 501 computer was installed by the Comptroller to phase out the centralized punched card installation which served the Support components of the Agency.

June 1961: An IBM 1401 was installed in RID to perform additional functions.

October 1961: A Bendix G-15 computer was installed in OC/E for work on special engineering problems. This computer was purchased and is still on hand.

February 1962: An IBM 1410 with a disk unit was installed to replace the IBM 650 in RID for WALNUT operations.

July 1962: An IBM 1401 was installed at NPIC for report generation.

November 1962: An RCA 301 was installed to provide input/output support to the RCA 501.

January 1963: A Computer Center was established by the DD/S (ADP Staff)--a service center for all Directorates. The two computers initially installed were IBM 1401 and IBM 1410.

February 1963: The UNIVAC 490 was installed at NPIC to provide on line support to analysts.

July 1963: The IBM 7090 was installed in the ADPS Computer Center to perform scientific computing for OSA and provide the Agency's first large-scale scientific computing capability.

November 1963: Two UNIVAC 1004's were acquired by OSA to provide data link facilities.

February 1964: An SDS 920 was installed in a compartmented section of the OCS (formerly ADPS) Computer Center for FI/D.

July 1964: A second IBM 1410 was installed in RID to replace the 1401.

October 1964: Collins Max I was installed overseas by COMMO.

December 1964: A third UNIVAC 1004 was acquired for the OSA data link.

December 1964: An SDS 910 was acquired for special operations in OEL.

January 1965: A second SDS 910 was installed in OEL.

C. Development of ADP Organizations:

1. There were numerous punched card data processing organizations in the Agency during the period 1947-1957, before the first computer was installed. The largest of these punched card organizations were in the DD/I (OCR).

2. The DD/P System Group was the first ADP staff established (about 1956) at the Directorate level--to develop Project WALNUT.

3. In 1958 the Automation Development Group was established in the DD/I, OCR. This staff was concerned primarily with the testing and implementation of the Minicard system.

4. Notice No. 7-200-2 (25 June 1959) announced the establishment of an Automatic Data Processing Committee "...to provide Agency-wide guidance and authoritative screening for all aspects of data processing requirements and equipment. ..."

5. In 1959 the DD/I Automation Staff was formed. This elevated computer planning to the Directorate level in the DD/I.

6. By September 1961 OCR consolidations resulted in a reduction from five punched-card organizations to two.

7. In 1961 Agency management created the CIA ADP Staff. This new Staff, with Agency-wide responsibilities, absorbed the DD/I Automation Staff slots and personnel, and the DD/S contributed additional slots from the former CIA Management Staff.

8. In July 1963 the ADP Committee considered alternative plans for organizing ADP resources in the Agency. Failing to reach an agreement, this committee became inactive.

9. In August 1963 the ADP Staff was renamed the Office of Computer Services and assigned to the DD/S&T.

10. In November 1963 the Automatic Data Processing Division (ADPD) was transferred from the Comptroller to OCS and absorbed into the CIA Computer Center.

11. In April 1964 the DD/I announced the appointment of a DD/I CHIVE Officer to represent DD/I management interests in this joint OCS/OCR project.

12. In May 1964 Panel 375 was established pursuant to DCI Action Memorandum A-375. Its purpose was to develop "the best possible information handling system for CIA."

13. In May 1964 the Information Processing Division, NPIC, was established to consolidate its two previous computer centers.

14. In September 1964 the DD/S designated a coordinator of electronic data processing activities in the Support Directorate.

15. In March 1965 the Support Information Requirements Group was established in the DD/S to develop an integrated management information processing system (MIS) to serve the Support Directorate and the Agency at large.

IV. MEASURE OF CIA ADP ACTIVITIES

A. Fiscal Years 1960 and 1965:

1. It is difficult to measure and compare the level of personnel (and consequently dollars) as well as equipment attributable to ADP activities in the Agency over a period of several years. This is primarily because there have been no satisfactory measurement factors established in this rapidly developing field. Even though ADP equipment and personnel utilization figures have been assembled annually by this Agency since at least 1959, this exercise has lacked continuity in several respects. For example, at times various ADP activities have been compartmented, for security reasons, from the group assigned to enumerate the ADP inventory. In fact, to date Agency management has not officially authorized and charged anyone with this total task. Prior to 1965 only unclassified information was assembled in the annual ADP report to the Bureau of the Budget. Even then, each of the Agency's fifteen ADP units (eight with computers and seven with only punched card equipment) which were counted in that inventory, made its separate decision on who to include in its count of ADP personnel. Consequently some counted Flexowriter operators preparing data in the customers' offices and some did not, and there were many other discrepancies in the count.

2. The Committee reviewed the figures that have been compiled over the past five years and agreed that the amounts stated below and shown in Figure 1 fairly represent the Agency's ADP dollar and personnel levels in 1960 and 1965.

3. In 1960 the Agency had two (2) small computers (ALWAC III and IBM 650). Total ADP costs for that year were figured to be roughly [redacted] and approximately [redacted] people were identified as being with the Agency's ADP activities. Most of these people were associated with punched card data processing operations. The principal functions performed by ADP in the Agency at that time were document control and administrative support.

4. In 1965 the Agency has [redacted] computers (counting the special COMMO switching facility). Total ADP costs for this year will amount to about [redacted] The count of Agency ADP personnel is roughly [redacted] Currently about ninety percent (90%) of the ADP dollars and seventy percent (70%) of the ADP manpower is devoted to computerized data processing; ten percent (10%) of the dollars and thirty (30%) of the manpower relates to punched card activities. ADP now provides some support to almost every type of activity in the Agency. Emphasis has recently been placed on developing advanced

mathematical and scientific computing capabilities. At the same time major new systems are being developed in the field of information retrieval and management support.

B. Fiscal Year 1970 - Projection:

1. The Committee was not able to come up with any scientific method for projecting the level of ADP activities in the Agency for the next five years. However, it recognized that it was probably in a better position than anyone else to make such an estimate for Agency management.

2. Undoubtedly, most punched card processing operations will be phased out by 1970. One major exception will be DD/I (OCR) information retrieval from existing punched card files which are prohibitively expensive to convert. Nearly all other functions now performed on punched card equipment will be handled on computers with fewer operators involved. However, this is probably the only factor by which the number of ADP personnel will be reduced during the next five years. Conversely, as computer hardware capabilities increase there follows a rapidly growing need for system designers, programmers, etc. This will be particularly true during the next five years with the advancement to third generation computers and the implementation of major ADP systems which are already under development in the Agency.

3. Probably the greatest impact on the Agency work force, resulting from ADP, will be in the area of data analysis or manual indexing and other functions required to prepare data for machine input. However, the ADP Committee has not dealt with that problem in this study.

4. As shown in Figure 1, the Committee's educated guess regarding 25X1 1970 is that the Agency's ADP personnel will number about [redacted] and annual ADP costs will be about [redacted] 25X1 25X1 [redacted] This could vary considerably due to the impact and effectiveness of advanced ADP technology which remains to be demonstrated. However, we are speaking of something which may approximate [redacted] the Agency's total 25X1 annual manpower and dollar assets. The ADP personnel projection is based on an assumption that total Agency manpower remains the same but as ADP activities increase the trend will be to develop new skills and shift personnel to ADP activities.

5. In return for these large scale expenditures, the Agency should be reaping major additional benefits from ADP by 1970. Projected advantages include the following: in the scientific area there will be flexible large scale analog-digital processing, remote display capabilities, and the most advanced mathematical computing support. Comprehensive intelligence collation and analysis support systems will be further developed. A significant portion of the Agency's new information retrieval system (CHIVE) will

be operational. There will be improved WALNUT services in the DD/P, with the integration of source data preparation overseas and high speed telecommunications with Headquarters computer processing planned. At NPIC, an extension of on-line remote terminal facilities will be serving analysts with displays and recall of target information, input and editing of reports, stereo measurement and sophisticated plotting. Computers will be introduced to help with the control and distribution of Agency cables. The security records system will be automated as will be significant elements of the Agency's printing workload. An effective computer driven management information system which reflects human, materiel, and financial resources should be a reality. Inevitably, there will be unforeseen new ADP applications in the Agency during the next five years.

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V. ASSIGNMENT OF ADP ROLES

A. Function Definitions:

1. ADP Management: Planning, coordination, and control of Agency ADP activities.

2. ADP Requirements: Identification of specific data processing needs. The first step in data processing is to define the requirements. Inherent in the function of requirements definition is the thorough study and analysis of existing systems, methods, and procedures; the creation of new functional systems structures; the identification of specific areas of activity which may profitably use ADP techniques; the determination of ADP feasibility; the implementation of improved manual methods; the specification of requirements to be satisfied by computer systems; and the collaborative participation with computer system designers and job programmers to ensure that the computer system designed will satisfy the requirements adequately.

3. ADP Systems Design: The preparation of complete project specifications and detailed logical processing ADP steps. ADP system design is a function normally performed by ADP system specialists having the highest level of technical skills and knowledge of requirements, working in cooperation with the people and components charged with responsibility for mission

accomplishment. The principal objective of ADP system design is to devise techniques and methods for the use of the best available equipment and devices to satisfy the ADP requirements.

4. ADP Job Programming: Writing, debugging and testing the complete sequence of job instructions (computer steps) in machine readable language. Programming relates very closely to system designing for any given job.

5. ADP Operations: This includes the operation of ADP equipment and the scheduling (subject to priorities established by management) and control of the data processed. Equipment operated includes computers and their peripheral or auxiliary hardware, independent punched card machines, etc. Scheduling and control includes the receipt, set-up, scheduling of data to be processed, the distribution of end products, and the physical control of machine language files (e.g., punched card and magnetic tape files) and processing instructions.

6. ADP Systems Programming: Systems programming (versus job programming) shapes the executive system program under which the computer handles all jobs. Systems programming has a direct bearing on job programming standards. Advanced ADP technology places increasing emphasis on the systems programming function.

B. Clewlow Report: The Clewlow Report specifically identifies assignment of ADP roles as a major problem, both within executive agencies and in the Government as a whole. It points out the complexity of the problem and indicates that there are no firm solutions regarding the organizational disposition of ADP resources.

> "The assignment of appropriate roles to the different echelons of management in the Federal Government is of great importance Some computer applications, particularly those involved in administrative functions, have a great deal in common and conceivably could be subject to greater centralization. On the other hand, the more significant computer applications are integral parts of agency programs; accordingly, each is a unique application and its management is a responsibility of those officials charged with mission accomplishment. The problem then becomes one of improving the effectiveness and the economy of computer utilization, both within an executive agency and in the Government as a whole, without derogating the proper authorities and responsibilities of managers in the line."

C. Executive Directives:

1. Since 1960 the Bureau of the Budget has addressed itself to specific problems relating to the management of automatic data processing in the Government through the issuance of circulars and bulletins. Each one has dealt with a particular subject surfaced to the Bureau of the Budget as a specific problem in ADP management at a particular time. The most recent of these, Bureau of the Budget Circular A-71, deals with responsibilities for the administration and management of automatic data processing activities within the executive

branch of the Government as well as within the individual departments and agencies. It represents, in a sense, the aggregate of the experience gained from their earlier one-problem-at-a-time approach taken together with the conclusions and recommendations offered in the Clewlow Report. CIA has had a somewhat parallel experience in the evolution of ADP activities as can be seen from the chronology of ADP developments listed earlier in this report. While the Agency has not had a central mechanism to govern ADP developments in the sense that the Bureau of the Budget is now suggesting executive departments and agencies should have, we have had a mechanism for monitoring developments in the form of the Automatic Data Processing Committee, the Automatic Data Processing Staff and its organizational successor, the Office of Computer Services. While these mechanisms may not have been completely effective in terms of exercising management control at the Agency level, they have served a useful coordinating and monitoring purpose. The absence of comparable mechanisms in other agencies probably led to the conclusions and recommendations set forth in the Clewlow Report, now adopted by BOB and endorsed by the President. Even though the Agency may not be in a position

to say that it has already satisfied all of the provisions of the Bureau of the Budget Circular A-71, it is fair to say that our growth in the automatic data processing business has not been any more proliferate than has anyone else's in or out of Government and that we may have given more attention to responsible Agency management from the over-all point of view than have a great many others.

2. BOB Circular A-71 states: "The heads of all executive departments and establishments are responsible for the administration and management of their automatic data processing activities including:

a. "Agency-wide planning, coordination and control of equipment utilization."

Comment: No viable mechanism exists in CIA with the clear mission to develop policy, coordinate planning, or otherwise monitor Agency-wide ADP activities.

b. "Determination and use of those equipment applications that offer the greatest return in terms of increased effectiveness in mission accomplishment and higher productivity."

Comment: Within CIA, judgment on these matters has been principally a Directorate

responsibility. To a limited extent but on the basis of the best information available, the Project Review Committee has given Agency-wide consideration to this problem.

c. "Development of data systems that employ the use of the most advanced design techniques."

Comment: The Agency's reputation and standing with regard to the employment of advanced techniques for information storage and retrieval is very high. It pioneered systems such as WALNUT and INTELLOFAX, and currently is designing CHIVE which incorporates concepts that are in the forefront of the field.

d. "Merger or integration of data systems irrespective of intra-agency or interagency organizational lines, when cost effectiveness in equipment utilization, data systems management, or program accomplishment can be increased."

Comment: The Agency has not had a practical means of monitoring cost effectiveness in equipment utilization in an over-all Agency context because no

satisfactory evaluative criteria have been established in the Agency or elsewhere in the Government. However, specific ADP units have been merged within and between Directorates. Recent examples include the merger of ADPD (Comptroller) with OCS and the consolidation of two ADP units at NPIC.

e. "Determination of automatic data processing equipment requirements."

Comment: The Agency has no effective mechanism for providing central technical review of Agency-wide ADP equipment requirements. However, long range equipment planning has been evident within the Directorates, e.g., Project WALNUT in the DD/P, and OCS plans involving third generation hardware.

f. "Sharing equipment time and services within the agency, and with other agencies through support of the Government-wide program for sharing exchanges; cooperation in the establishment of service centers and other interagency joint use arrangements."

Comment: The Agency's ADP components share equipment time and services regularly. Files and

programs are exchanged with NSA, DIA and other members of the Intelligence Community. Computer time is provided to other Government agencies within the limits of security considerations and likewise Agency jobs are sometimes run on other Government computers.

g. "Consideration of the potential impact of the introduction of ADP equipment on the agency work force and taking such steps as are necessary to alleviate adverse effects to the greatest extent practicable."

Comment: No over-all Agency approach to this problem has been developed, even with respect to determination of the suitability or re-training potential of punched card personnel for computer operations. It should be noted, however, that CIA has long had various man-machine systems of recognized support capability and that Agency personnel, generally, have accepted the fact that machines are useful tools; introduction of computer equipment, therefore, has less negative impact here than in organizations without experience with punched card equipment.

h. "Participation in Government-wide studies and programs for improving the administration and management of automatic data processing activities in the Executive Branch."

Comment: The Agency participates, within security limitations, in several inter-agency groups which deal with ADP problems. These groups include the Interagency Committee on Automatic Data Processing, the Interagency Group for Research on Information Systems (IGRIS), the USIB Committee on Documentation (CODIB), and the Committee on Scientific and Technical Information (COSATI).

3. The intent of the Directives is to ensure that ADP functions in each Agency will be managed effectively with appropriate care and attention given to cost of mission and effectiveness.

D. Agency Considerations

1. Although security problems and advanced ADP technology have a strong bearing on ADP activities in the Agency, the Committee dealt primarily with the problem of organization and the assignment of ADP roles.

2. Throughout its deliberations, the Committee recognized that ADP is certain to expand and play a larger role in CIA over the next decade. ADP is a highly technical and complex function involving more and more of the Agency's manpower and dollar resources; therefore, it deserves greater attention by Agency management.

3. While computers alone are not going to provide the total answer to CIA's problem of analog and digital data indigestion, they offer the only practical means of coping with the high data volumes collected in the intelligence process.

4. The majority of the Committee felt that there is a clear distinction between coordination, review and other staff functions which need to be performed on an Agency-wide basis--and directly responsive to top management--and line responsibilities for the conduct of ADP operations. A further distinction was drawn between types of applications. There are those clear-cut production jobs in all Directorates which lend themselves to central processing while other ADP applications are most effective under complete Directorate control.

5. The ADP Committee concluded that the position of Assistant for Data Processing should be established at the DCI level. At the same time it agreed that there is a need for equivalent staff functions to be performed at the Directorate level. Finally, it endorsed the idea of a CIA Computer Center to perform requested services for the Directorates and it developed a concept for approving mission-oriented computer facilities.

E. How to Organize ADP in CIA

1. The Committee considered several alternative approaches to organizing ADP in CIA, ranging in extreme from full centralization of all ADP resources in the Agency under the command structure of one organizational component to total decentralization with ADP units in as many components as may feel the need to have them. Other alternatives between the two extremes were also discussed in varying degrees of depth. The consensus of the majority of the members, however, seems to be that in the absence of better evidence than is presently available (or could in the time available, be produced by the Committee) no one of these alternatives could be recommended more highly than another. All rejected total decentralization. One member supports total centralization. Two members felt that on-line applications involving complex interplay between manual and computer based reference facilities, as well as certain developmental activities, and certain highly sensitive applications, can be most effectively managed under complete Directorate control. The other two members believe it feasible to have selected decentralized facilities serving the command structure of the environment in which they are located while preserving centralized technical management control over equipment and ADP personnel without doing total violence to either principle.

2. A part of the difficulty is the lack of complete unanimity among the members about what is, or should be, meant by such terms as "mission-oriented" and "ADP Center." "Mission-oriented" can be interpreted to mean "devoted exclusively to and an integral part of the data processing continuum of a particular function," such as the RID index and document retrieval system or the Special Register of OCR; or it can be interpreted to mean "devoted exclusively to the satisfaction of the data processing requirements of a particular organization component," such as the Clandestine Services or the entire Office of Central Reference. The term "center" can be interpreted to mean "equipment, equipment operators, and system programmers"; it can be interpreted to include equipment, equipment operators, system programmers, job programmers, system analysts, and system designers; it can be interpreted to include varying combinations of these or other categories of technological expertise; or, to further complicate the issue, it can be interpreted to include kinds of service rendered in addition to the several combinations of expertise available. When the two terms are combined to describe a "mission-oriented center," the potential for misunderstanding, or lack of understanding, is infinite. In an atmosphere of terminology as imprecise as this, the Committee was unable to obtain unqualified acceptance of a premise that the

preservation of the status quo represents a condition or set of conditions which should or should not continue indefinitely to be tolerated.

3. The Committee recognized that four major ADP facilities now exist in OCS, RID, NPIC, and OCR. The first three are computer based and the fourth is punch-card based. Each of the latter three considers itself to be a "mission-oriented center," but the consensus of the Committee is that at least two, and perhaps all three, represent differing applications of the two terms individually and in combination. The individual Directorate philosophies can be seen in the attachments to this report.

4. The course which most closely expresses the majority view is presented below. The Committee notes, however, that the validity of settling on any one course is suspect because criteria to measure effectiveness of mission accomplishment and security considerations in balance against cost of one or another of the several possible alternatives have not been established to everyone's satisfaction. The development of such criteria, therefore, is a major task to be undertaken to permit informed management decisions to be made. With this basic point in mind, the course suggested is to:

a. Establish a staff in the Office of the DCI to assist him in providing Agency-wide policy, coordination, and management of ADP plans, activities, and operations. This staff should consist of an Assistant For Data Processing and a group qualified to recommend to the DCI suitable courses of action with respect to ADP in the Agency. Its responsibilities should include the following:

1. Advise and represent the DCI on matters relating to ADP in CIA.
2. Serve as the focal point in CIA for the development and enunciation of policies, criteria, and standards governing the selection, acquisition, and application of Agency ADP resources.
3. Recommend new ways to exploit ADP capabilities in support of substantive, operational and administrative Agency interests.
4. Plan for the most effective development of Agency ADP data systems, and for the employment of the most advanced ADP techniques.
5. Review Directorate ADP plans to ensure their consistency with the over-all Agency plan.

6. Define training requirements; develop an educational and training program to promote better understanding of ADP and broaden the general background among Agency managers at all levels; provide for the development of a suitable inhouse training capability as required; and plan for the systematic participation by selected Agency employees in suitable internal and external training programs.

b. Establish a comparable capability in each Directorate to coordinate ADP activities. Duties would include: defining the Directorate's data processing requirements and serving as a focal point for review and coordination of Directorate and inter-Directorate ADP interests.

c. Accept and recognize three demonstrably needed computing centers and one major punched card facility in CIA at this time. The principal one--the CIA Computing Center, offers centralized services to all Directorates. The two computing centers, in NPIC and in DD/P, and the OCR Punched Card Center support their respective line organizations. New centers are to be established when the need arises and if they can be justified. Recommendations for establishing

new centers would be reviewed by the Assistant for Data Processing. Conversely, if conditions indicate that fewer centers are desirable, the Assistant for Data Processing would have the responsibility to recommend that action to the DCI. A suggested list of functions for the Assistant for Data Processing is contained in Attachment A.

5. The DD/S&T member of the Committee, Dr. Brown, is not in agreement with the above. He feels that important economic and technical matters were given little, if any, consideration. Therefore, he has prepared his separate views on organizing ADP in the Agency. These are contained in Attachment E.

VI. CONCLUSIONS

1. ADP activity in CIA is expanding rapidly and is certain to have a long-range impact on the effectiveness with which the Agency and the Intelligence Community manage and use their substantive and administrative data.

2. ADP per se is a highly specialized function. However, its utilization as a management tool must be fully explored. ADP is closely tied to technological development and must therefore be staffed with professionally qualified personnel if optimum results are to be attained. It requires a concerted effort to educate and broaden the general background of Agency managers at all levels in the potential and capability of modern technology.

3. ADP activities in CIA are partially dispersed and there is a great and continuing need for increased communication and education among Directorates on ADP matters.

4. The focus of ADP management should be placed at the top of the organization to enable the Director to meet and fulfill his responsibilities under existing executive directives.

5. The ADP security problems which confront CIA are not dealt with in Government-wide regulations, BOB guidelines or proposed legislation.

6. The Office of Computer Services in the DD/S&T, in addition to the support of its Directorate, should be charged with performing those computer services requested by the various components of the Agency.

7. New computer centers should be authorized only when justified and approved by the Director.

VII. RECOMMENDATIONS

1. The growing importance of ADP in CIA and in the intelligence community should be recognized and the DCI should appoint an Assistant whose principal responsibility is to advise and represent him on matters relating to ADP.

2. The Assistant for Data Processing should be charged with advising the DCI on Agency progress in compliance with Executive Directives on ADP.

3. The Assistant for Data Processing and a staff of technical personnel should be attached to the Director's Office to advise him on matters relating to ADP and to recommend suitable action.

4. Each Deputy Director should appoint an ADP Coordinator to define his Directorate requirements for ADP support and ensure their coordination with Agency plans.

5. The Executive Director's Panel 375 and the CIA ADP Committee should be dissolved with the establishment of the position of Assistant for Data Processing in the Director's Office, and Directorate ADP coordinators to meet at his call.

ATTACHMENT A

SUGGESTED LIST OF FUNCTIONS FOR THE ASSISTANT FOR DATA PROCESSING

In executing the responsibilities listed in the ADP Committee Report on ADP the Assistant for Data Processing, in coordination with appropriate Offices, shall:

1. Personnel and Training

   - Develop appropriate plans and policies with respect to effective acquisition, education, utilization of ADP personnel resources.
   - Establish Agency standards for recruitment, selection, and placement and development of ADP personnel.
   - Prepare job standards for measuring ADP employee performance and productivity.
   - Establish ADP orientation programs for Agency management and training programs for ADP personnel.

2. Equipment and Services

   - Serve as the principal Agency contact with the manufacturing and professional ADP community.
   - Review and coordinate Agency R&D in the ADP field.
   - Review and make recommendations on proposals and contracts for the acquisition of ADP equipment, ADP studies, or software (above dollar limits to be established).

- Develop criteria and standards for ensuring optimal performance of ADP tasks throughout the Agency.
- Review and recommend the establishment of new computer centers if justified and conversely the dissolution of old centers if such conditions as new technology, organizational change, economy, or operational effectiveness in mission accomplishment so warrants.

3. Operations

- Coordinate inter-Directorate programs. Identify those programs which cross Directorate lines and stimulate joint planning to ensure system integration.
- Review and make recommendations concerning the development of new ADP applications.
- Produce standards for management reporting about ADP and computer center operation.
- Audit, monitor, and evaluate ADP operations in the Agency.
- Promote maximum sharing of ADP equipment, time, and services throughout the Agency.

ATTACHMENT B

12 May 1965

ADP PHILOSOPHY OF THE INTELLIGENCE DIRECTORATE

1. Having suggested a DD/S study of Agency computer needs in 1958 and, indeed, having pioneered machine applications in information processing in 1947, the DDI area has consistently urged the use of machines as tools whether they be typewriters, reproduction gear, punched cards or computers. We have also consistently argued for guaranteed, non-competitive use of whatever machines are part of our system in order to perform our mission. We agree with the need for high level ADP policy direction and with the comments concerning a central point for coordinating equipment procurement above a fixed cost level, for recruitment and training, R&D stimulation, etc. but we have no reason to believe, and know of no Agency study which proves, that the location of equipment in a centralized facility outside of the DDI to support the DDI mission will be more efficient. On the contrary, we are convinced by virtue of NPIC and OCR experience, that their large-scale activities are increasingly successful as their machines are intimately interwoven in their customer service and/or production programs, in a management environment which allows for flexible adjustment to changing needs and for "on-hands" experience with the machines. We believe that this view can be supported by Mr. Clewlow's report and by the Bureau of the Budget Circular A-71.

2. We do not quarrel with the probability that computer centralization saves money and scarce manpower in certain administrative, mathematical/scientific, and "special" projects outside the purview of NPIC and OCR, and have, indeed, encouraged research office use of OCS facilities, particularly in the pre-CHIVE world. But we are concerned that the computer, with its power (both real and over-estimated) retain its role as a support tool and that the DDI mission and authority remain clearly delineated in intelligence information processing and production discussions and activities within or outside of CIA, including those relating to information exchange with others, whether the base be hard copy documents, card decks or tape/disc files. It was for these reasons, and particularly because of our strong conviction that most effective management would result from direct administrative control over our own support equipment, that the DDI requested return of Project CHIVE personnel and equipment in his memorandum to the DDS of 30 July 1963. Although circumstances precluded

this and we have acted in keeping with the directions given by senior management, the review requested by the Executive Director-Comptroller in his Action Memo A-444 provides the opportunity, and in fact, calls for us to repeat our earlier philosophy, since we still hold to it.

3. Our present ADP structure, and that proposed, by no means reflects a proliferation of computer centers. We have now computer equipment in NPIC only; we have EAM equipment in OCR and, on a very limited scale, in OO/C, the latter physically located outside the Headquarters Building. We propose that OCR have computer equipment under its own management when CHIVE is operational.

4. The ADP field is still one which is foreign to most Agency managers. There is rightful concern, both in-house and elsewhere in Government, that ADP developments occur according to plan and policy to constrain costs and ensure optimum utilization. But there is also rightful concern that many assumptions about advantages of centralization of equipment are unproven and, even, false.

25X1

Executive Assistant to the AD/CR
(DD/I Member ADP Committee)

SECRET

IPD/NPIC-118-65
7 May 1965

MEMORANDUM FOR: DD/I Member, ADP Committee

SUBJECT : NPIC Contribution to ADP Committee

REFERENCE : A. Executive Director -- Comptroller, Action Memo A-444
B. OCR Memo, 8 April 1965

1. In accordance with your request, as stated in Reference B, I am forwarding the attached study of NPIC's ADP interests for submission to the ADP Committee. This study follows the outline presented by [redacted] at your initial ADP Committee Meeting, 6 April.

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2. At the second meeting of the ADP Committee, it was agreed that Section E of the proposed outline would be dropped, that the initial submissions would contain a summary of current ADP resources and estimates of ADP requirements over the next five years. NPIC's ADP resources are contained in Section B of the attached study. NPIC's ADP requirements are stated on the attached forms, as requested by Dr. Brown.

3. I have not attempted to estimate the man years or the System 360 configuration required for each requirement. I believe our gross man-year projection contained in Table I of attachment, which is based on an analysis of experience to date and anticipated NPIC requirements, are far more realistic than individual crystal ball guesses for each requirement. Similarly we are not sufficiently familiar with the System 360 models to specify configuration for each requirement. They will all operate on UNIVAC 490 family real-time systems with mass storage and such specialized equipment as indicated specifically for each requirement.

25X

[redacted]
Chief, Information Processing Division

APPROVAL: /s/ 7 May 1965
ARTHUR C. LUNDAHL
Director, NPIC
Date

Attachment: a/s

Automatic Data Processing at NPIC

A. Present ADP Philosophy and Structure

1. The present ADP philosophy at NPIC evolved out of the original concepts for data management established concurrently with the establishment of project [redacted] Underlying these concepts is the premise that each component has a clearly defined mission to accomplish and must be given adequate resources to attain its objectives. 25X1

2. The original concept of project [redacted] envisaged using the Minicard System as a mechanism for storage and dissemination of imagery collected by the U-2 system. With the Minicard equipment on hand, it was natural that it should also be applied to the storage and retrieval of document images to provide collateral support to the photo analyst. To supply additional summary target-oriented background information, a system was evolved wherein an "encyclopedia" was maintained in punched-card form and reproduced prior to the start of first-phase exploitation for any mission. From this came the present procedures of supplying "Target Briefs" to the PIs for each mission, and the partial mechanization of first and second phase report production with automatic incorporation of the substance of these reports back into the Target Brief File. Begun on conventional tabulating equipment, this system was eventually transferred to an IBM 1401. This, together with the Minicard establishment, constituted the automatic data processing operation of the Data Management Division and later the Collateral Support Division. 25X1

3. Concurrently, management determined that electronic computers would be used to facilitate the various computational procedures of analytic photogrammetry necessary to meet analyst requirements for derivation of metrical information from photography. In 1957 the Agency's first computer (ALWAC III E) was requisitioned. To improve the response time of the system to the requirements, the concept of dispersed photomeasurement equipment on-line with a common computer was developed. The actual implementation of this system has proceeded with the acquisition of the UNIVAC 490 as the computational element for the system. The criteria on which this selection was based were derived from postulated peak loading requirements, as are the criteria used in design of any "real-time" system. One consequence of designing for peak loading is that total central processor time normally required for the so-called "real-time" application is only a small percentage of the total available. In this particular instance a substantial amount of time is required for executing batch programs that support the "real-time" system, but well over 50 percent of total main frame time is still available for other purposes. (It should be emphasized that this time is assembled out

of increments ranging in size from milliseconds to several minutes.) As the Photo Measurement System moved toward realization it became more and more deeply involved in problems arising in the creation and manipulation of large data files.

4. The UNIVAC 490's file manipulation capability (coupled with a central processor with time available for multiple processing) and the lightly loaded printer offered an obvious solution to the overload on the IBM 1401 that resulted from the increasing size of the Target Brief File and higher frequency of success in collection efforts. Looking further ahead, the existence of an extensive system for intro-center communication with the U-490 central processor offered an interesting vehicle for experimentation with various approaches to "on-line" information retrieval that might greatly reduce the amount of Target Brief printing associated with each collection effort. These considerations dictated a centralized approach to the use of such equipments in support of NPIC's photo-exploitation activities.

5. On 4 May 1964 the Information Processing Division was established in NPIC by merger of the personnel and equipment of the two groups previously mentioned. IPD is responsible directly to the Executive Director, NPIC for providing on-line, real time and batched scientific computation, and information processing and data retrieval computer services in support of NPIC, and the departmental activities of the Service/Agency Detachments and select components of the Intelligence Community. (See NPIC organization chart and IPD Mission and Function statement attached.) The consolidation of NPIC's human and physical ADP resources into a single management entity is proving to be a significant contribution to NPIC's ability to maintain its leadership in the development and implementation of the most effective and efficient data processing techniques used in the photo intelligence community.

6. We believe performance has validated the original [redacted] philosophy and that it is consistent with BOB circulars and the Clewlow Report. In our judgement, experience has shown that those components which have been free to develop their own ADP resources in support of their own mission and functions have succeeded in implementing efficient operating systems responsive to their needs and that those components which have had to depend upon centralized services have not had comparable success. 25X

7. This judgement is further borne out by the conclusion of the Clewlow Report which states:

> "The assignment of appropriate roles to the different echelons of management in the Federal Government is of great importance. Some computer applications, particularly those

involved in administrative functions, have a great deal in common and conceivably could be subject to greater centralization. On the other hand, the more significant computer applications are integral parts of Agency programs; accordingly, each is a unique application and its management is a responsibility of those officials charged with mission accomplishment. The problem then becomes one of improving the effectiveness and the economy of computer utilization, both within an executive agency and in the Government as a whole, without derogating the proper authorities and responsibilities of managers in the line." (Page 4)

8. In line with the Clewlow Report, BOB Circular A-71 only makes heads of executive agencies responsible for "merger or integration of data systems...when cost effectiveness in equipment utilization, data systems management, or program accomplishment can be increased." We do not believe that any increase in cost effectiveness in equipment utilization, data systems management, or program accomplishment can be increased." We do not believe that any increase in cost effectiveness would be gained by any centralization beyond that already accomplished within this Center. In fact we believe that NPIC's program accomplishment would be impaired by any move that in any way takes away from the Director, NPIC his control of the tools required to fulfill the mission of this Center.

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ATTACHMENT B

DD/S 65-2290

17 MAY 1965

MEMORANDUM FOR: Chairman, CIA Data Processing Committee

SUBJECT : Support Philosophy of Computer Services

1. As you know, the Deputy Director for Support has been among the proponents of the philosophy that the requirements of the Agency for electronic data processing capability can best be served by a centralized organizational structure. We continue to believe that this is a valid principle although agreeing that the term "centralization" may need some clarification.

2. We look to the Office of Computer Services to provide a centralized computer support service for the Agency in much the same way that the Support components themselves function. The Office of Communications probably offers the most closely related analogy because it, too, is a technical component employing technical equipment and personnel. To follow the analogy through, when the Clandestine Services create a new station or base with perhaps only two or three people, the Office of Communications will undertake to train one of them in a relatively unsophisticated system of communicating. When the station grows and its responsibility expands, the communications capability will be increased proportionately by furnishing more elaborate communications equipment and qualified technical personnel to operate it. In keeping with this philosophy, we would look to the Office of Computer Services to furnish support to satisfy our EDP requirements following the same general pattern. In the event that we might have a requirement, for example, which can best be satisfied by having one or more of our people trained in EDP techniques, we would expect to proceed in that manner. As the requirement expands or as we create requirements of more significant magnitude, we would look to the Office of Computer Services to furnish us with the proportionate technical expertise.

3. Electronic data processing equipment, equipment operators, and programming personnel fit quite conveniently and clearly within the concept just described. When system analysts and system designers are added, however, the concept tends to be less clearly understood. If we consider the overseas station to be a "system," however, the same analogy can be reasonably applied. In this context the "system" is composed of all of the operational and management

functions for which the Chief of Station has responsibility. In the analysis of his "system," he must so define his operational and management requirements that the type of support to be furnished can be readily determined. His need to solicit staff assistance and technical advice from the Office of Communications or other affected Support components in arriving at a definition of the station's Support problem and requirements will bear a direct relationship to the volume of business projected for the station and the relative complexity of its management structure. Based upon the Station Chief's definition of the requirements of his system, the Director of Communications will "design" a communications system and furnish equipment of an appropriate level of sophistication and personnel to operate it in sufficient numbers to maintain the hourly and daily coverage needed. In the same way, management throughout the Agency develops its own systems and identifies the communications requirements to support those systems. The Office of Communications designs the communications systems to satisfy those requirements and furnishes equipment and personnel to operate it as necessary. We believe the analogy can be made to apply to EDP support for the Agency and that management throughout the Agency should develop its own information and data processing systems and identify the requirements for electronic data processing support. The Office of Computer Services then should design computer systems to satisfy those requirements and furnish equipment and personnel to operate it in whatever environment is appropriate.

4. Carrying this one step further, positions throughout the Agency requiring a data processing competence could be identified and a new data processing career service could be created. The personnel involved could be given the option of retaining their present career service designation or converting to the new one.

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Special Assistant to the
Deputy Director for Support

(DD/S Member ADP Committee)

ATTACHMENT E

11 June 1965

EXCEPTION STATEMENT ON ADP COMMITTEE REPORT

1. The purpose of this exception statement by the DD/S&T Representative to the ADP Committee is to sharpen the focus on the nature of the organizational issue in question here and to provide Agency Management with some coverage of the economic and the technical considerations relevant thereto. Also included under "Conclusions" is a course of action for consideration.

2. The management question posed in Action Memorandum A-444 is:

> Given CIA's increasingly heavy investment in computing activities, how should Agency Management organize those resources for the next five year period to maximize effectiveness at minimum cost?

Stated in alternative form, the basic question becomes:

> Shall CIA continue and extend until complete its present effort to centralize computing resources at the CIA level?

or

> Shall CIA dissolve what is now structured at the CIA level (OCS) and reorganize its computing resources at the Directorate level?*

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* [redacted] 25X1

3. The ADP Committee's majority conclusion is that the CIA-level centralization thrust, which has characterized CIA organizational actions in recent years, should not be continued; instead, it should be checked...and even reversed. The Committee's report is intended to lay the groundwork for a) assuring continued separateness of the Agency's present computer centers, and b) creating a management climate within which additional centers might reasonably be expected to emerge.

4. There are three logical areas of consideration regarding the organization of CIA's computing resources: (a) technical, (b) economic, and (c) political. The Committee has seriously concerned itself in both its discussions and its report with but one of these areas: the political. *

5. If it is reasonable to assume that Management, before making this study assignment to the Committee, was already familiar with the major political considerations involved here, then what Management most needs is coverage of the other aspects of the question; i. e., the economic and technical considerations. The Committee has not provided coverage of same to Management in its report because it was the majority opinion of the Committee that sufficiently reliable technical and economic projections were not now possible as ingredients to Management's decision on the organization of CIA EDP** resources. The DD/S&T Representative, however, feels economic and technical projections not only can be made but, indeed, must be made if Management is to be equipped to consider this organizational question. These are the sine qua non ingredients of such decision.

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* The term "political" is not used to deride or belittle this area of consideration. Political considerations (such as present organizational lines, functions, habits, preferences, and plans) are important and must be taken into account by Management in any organizational decision. Directorate security concepts, as a specific, are part of these "political" considerations. (See Para. 8 below)

** The acronym "EDP" (Electronic Data Processing) is used in this report to mean "computing" or "relating to computers."

6. TECHNICAL CONSIDERATIONS:

a. State of the EDP Science:

The computing science is moving into a dramatic third generation. New generation capabilities in both hardware and software constitute the largest step forward in both productivity and reduced costs in the history of the computing era. As a consequence, the new generation capabilities will have a major impact on all aspects of computing, including the organization of computing resources.

Some new generation characteristics:

- New generation gear is faster by several orders of magnitude.

- Its high speed memories have much larger capacities.

- Immediate "on-line" access to very large information files is now feasible (several billion characters of on-line storage).

- A vast array of remote terminals for input, query, and display can now be handled. . . a requirement in upcoming computing support to all CIA Directorates.

- New generation systems will operate under sophisticated Executive Control Programs which enable the computer to pace and control its own work. . . to the near exclusion of the Computer Operator in the traditional sense. Manual control of the computer from job to job (serial processing) will be grossly inefficient.

- The capacity for work is increased manyfold. Thruput for the IBM System 360 Mod 67, for example, is equivalent to eight 7090's or thirty 1410's or thirty-five RCA 501's. . . even when operated serially.

- The larger models of the new generation computers provide major bonuses over the smaller models... in work capacity, in sophistication of techniques, and in significantly lower costs per unit of data processed.

b. Impact on Organization:

The impact of the above processing capacities of the new generation hardware and software will be felt in virtually all aspects of computing--management, user, and EDP areas alike.

The direction of impact on organizational structure is patently clear. The tremendous work capacity, the far-reaching systems design implications, and the pronounced cost advantages of the larger models relative to the smaller models will force greater centralization throughout the computing field.

c. The new generation OCS Computer Center:

During the past twelve months, OCS has developed its plan to shift to new generation equipment as rapidly as possible. All computers in the present CIA Computer Center will be replaced by but two IBM 360/Mod 67 computers. The first one will be installed in nine months; the second twelve months thereafter. CIA will be one of the first major centers to shift to new generation capabilities. This is much more than a status symbol; the production and economy gains are truly remarkable.

Some specifics on the OCS third generation center:

- The OCS configuration will be a twin-Mod 67 system to which the full range of peripheral devices can be attached as required by Agency needs.

- The OCS system is a complete "fail-soft" system. That is, all components are duplicated in the system so that failure of any component does not stop the functioning of the system... it only reduces thruput. The on-line systems now in development in support of all Agency Directorates will require such fail-soft support. (This fail-soft structuring of the machine configuration will tend to characterize future computing centers of whatever size.)

- The specific configuration of hardware selected by OCS is based on the OCS workload as OCS is now charged within CIA (all Headquarters computing except RID.)

- Projected scientific computing needs of themselves would require a system of similar scale to that planned for the CIA Computer Center because of the stringent speed, memory, and backup requirements which characterize such applications. The production capability of the system, however, would be only very partially tapped if limited to scientific applications alone.

- The Mod 67, selected for the CIA Computer Center, falls in the "upper middle" size range. There are two larger models and three smaller models announced to date. (The Mod 67 is the smallest model of the new IBM 360 series which possesses the I/O controller and sub-selector multiplexor capabilities. These capabilities, in themselves, represent a major third generation stride.) The next smaller model (Mod 50) does not have the capacity to support the Agency's more demanding scientific tasks... and is considerably more costly per unit of information processed.

- No change in the main frame configuration of the OCS Center would be required to do all Headquarters Building computing as anticipated for the next 3 to 5 years.

- If and when additional main frame processing power were needed at some future date, a third CPU could be very simply added to the planned configuration at a cost of about [redacted] This additional CPU, [redacted] would provide additional processing power to the system equivalent to five Mod 50's... each one of which would cost much more.

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- OCS estimates that all Headquarters Building computing (OCS and RID) can be done on the Mod 67 system within a single shift. This is intended as a measure of work volume only. Any center, of course, which serves remote terminals in user areas must remain open during periods of authorized usage.

d. Other pertinent specifics:

- New generation gear will process most efficiently with a job mix of maximum diversification. If restricted, organizationally or otherwise, to a single application, much of its thruput power is wasted.

- The concept of re-structuring Agency EDP resources along Directorate lines suggests the following penalties:

  1) The Mod 67, while doing DD/S&T processing, could concurrently process all other Agency computing with less than 15% delay (under worst peak conditions) to DD/S&T processing.

  2) All non-DD/S&T internal computation tasks would be serviced by the Mod 67 in less than half the time required on Directorate centers equipped with their own Mod 50's (the next size down from the Mod 67) and all purely input/output flows (no computation) would run on the Mod 67 system in slightly better time.

- Software extensions and improvements over time will continue to increase the thruput of the gear under discussion so that appreciable increases in workload can be absorbed without acquisition of additional main frame equipment. OCS has projected a utilization of 130 hours per month initially on the Mod 67. Software improvements should permit the handling of a four-fold increase in work in something less than double the machine time.

- Can the IBM 360 software, which is yet to be proven in operations, be counted on to meet specifications? - OCS feels the risk here is a safe one. IBM has traditionally equipped its users with the strongest software packages in the computer industry. This massive corporation has staked its entire future on the success of the 360 system--including software. IBM is less likely to fail in its commitments than its users are to fail to fully exploit the capabilities being offered.

- The full exploitation of new generation capabilities will require on the part of user organizations advanced technical capabilities in the systems programming area. Although OCS has made a strong start over the past two years at assembling a pool of such skills, system programming skills will be in short supply in CIA and throughout the computing industry with the advent of third generation processing. Decentralization of computing to the Directorates would serve to make the shortage of such hard-to-find and slow-to-grow skills all the more critical.

- The Committee's report contains the following statement: "...'on-line' applications involving complex interplay between manual and computer based reference facilities... are most effectively managed under complete Directorate control."

  The above statement is in no way concurred in by the DD/S&T representative. There are no technical arguments to support it, and it is directly contrary to good economics.

7. ECONOMIC CONSIDERATIONS:

This section presents some measure of the price tag attached to decentralizing Agency EDP resources to the Directorate level. Three types of resources have been considered: a) machine rental dollars; b) people; and c) Headquarters floor space. The figures given are minimum figures in each instance. Although this section on economics is brief, its relevance and import to the organizational issue is second to none.*

* Major economic overtones are apparent in the preceding section on "Technical Considerations".

a. Additional Rental Costs

In measuring the hardware rental costs for additional centers, the following guidelines were followed:

(1) Costs of "remote on-line" devices and extra capacity peripheral equipments (such as multiple data cells) were excluded. (Basically, they are constant costs whether hooked to Directorate Centers or to the CIA Center and are thus irrelevant to Management as a decision factor).

(2) Only those peripheral devices necessary to the operation of a stand-alone center have been included.

(3) A double-thruput configuration has been assumed for all centers because:

> EDP systems in development to support all Directorates (CHIVE, MIS, scientific systems, WALNUT, etc.) call for remote terminals in user areas. The machine language data store for such systems is retrievable only with great difficulty in the event of equipment failure. Thus, in practice, it would be highly improbable that any center, centralized or decentralized, would not find valid justification for double thruput support within the first two years of the five year period under consideration.

The minimum additional annual rental for equipment for any Directorate-level center is presented in Table 1 on the next page.

Table 1

MINIMUM ADDITIONAL RENTAL COSTS PER CENTER *

(360/MOD 50 Center)

Quantity	Unit #	Description	
2	2050	Mod 50 CPU	
4	6980	Selector Channel	
-	4478	1401 Computability	
2	1052	Adapter	
2	2804	Tape Control	
5	2402	Mag Tape $1,520	
5	7161	R/W $20	
2	2841	Storage Control	
2	7950	2302 Attachment	
2	2302	Disk Storage	
2	1052	Printer-Keyboard	
2	2821-5	Control Unit	
2	3615	1100 LPM Adapter	
2	2540	Card Read/Punch	
2	1403	Printer	
		Minimum Total Per Month	

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MINIMUM ADDITIONAL RENTAL COST PER CENTER.... 25X1

* "Additional" means extra costs per center which would result from Directorate-level structuring as opposed to CIA-level centralization.

b. Additional People:

The personnel figures given in Table 2 are, in each case, minimum extra personnel requirements to be expected with the endorsement of Directorate-level centers instead of CIA-level centralization.

Computer Operators - Multiple computing centers, of course, mean more computers (2 per center) and more computers mean more Computer Operators. Two-shift operations are assumed in Table 2.

Systems Programmers - As pointed out in Paragraph 6, above, third generation gear and remote terminal systems will force the development and use of Executive Programs for automatic control of operations. Systems Programming will become a must in staffing any center. Our figure of four Systems Programmers per local center is an initial level only; expansion to more than twice that level would soon become a requirement.

Managers/Supervisors/Secretaries - The additional personnel needs in this category stem from the requirement that each EDP center appoint the following: Chief of Operations/Deputy/Secretary; Chief, Systems Programming; Chief, Job Programming/Secretary; Chief, Systems Design/Secretary; Chief, Punch Section; Shift Supervisor of computer room, etc. The figures given in Table 2 are thus very conservative.

Systems Designers/Job Programmers - EDP Systems Designers and Job Programmers have been omitted entirely from Table 2 because of the difficulty of finding an agreed-upon algorithm. Decentralization would, nonetheless, consume additional Designer and Job Programmer man-hours and would retard development of skills.

c. Headquarters Building Floor Space:

The entries in Table 2 are self-explanatory.

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The NPIC Center in [redacted] will remain as a physically separate center whether or not full centralization of Agency EDP resources is determined upon by Management...unless or until adequate and secure communications facilities are installed between the Headquarters Building [redacted] Thus, in this Section on Economic Considerations, NPIC has not been reflected. Full centralization of CIA EDP resources would produce technical and some manpower gains (in the management/administrative, programming, and career development areas) but hardware and space costs would not be affected.

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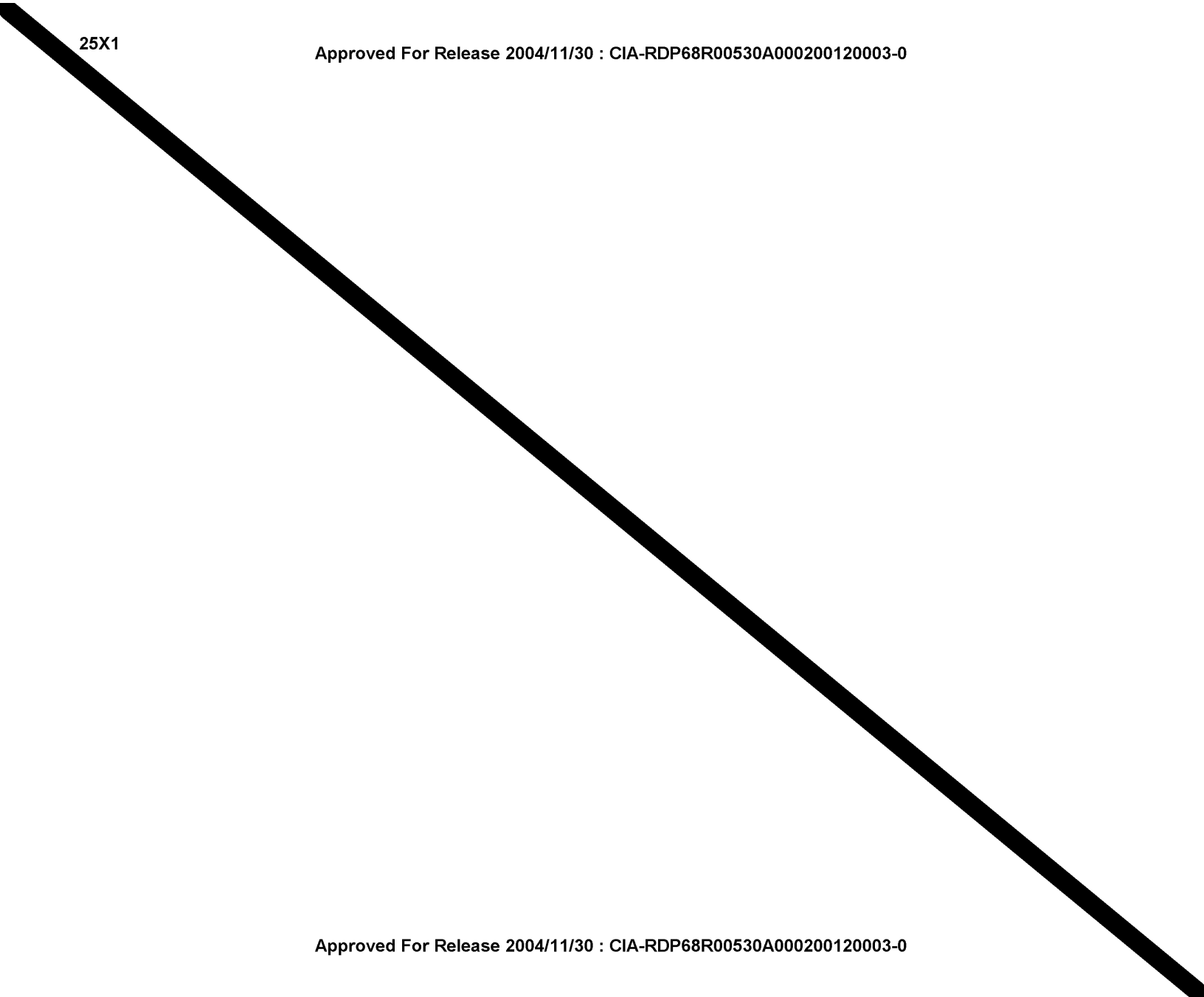
For the additional dollar, people, and space resources required by decentralization of EDP operations to the Directorates, see Table 2 on the following page.



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8. POLITICAL CONSIDERATIONS

There are four parts to "Political Considerations." The first of these is clearly anti-centralization at the CIA level; the second and third of these support such centralization; the fourth (security) is, perhaps, a matter of opinion and can be viewed either way.

a. The "Directorate" Focus:

From a purely parochial view, each Directorate (and NPIC) would probably prefer to have its own EDP resources... people and machines. The majority of the Directorate Representatives to the Committee have reflected this kind of judgment. Some of them feel very strongly about it. It must be noted that this attitude is the only element of this entire organizational question which does not support centralization at the CIA-level. Thus, Management must pay it particular attention and weigh it carefully.

In sum, DD/P wants its own center, NPIC wants its own center. DD/I wants its own center. DD/S has traditionally supported centralization at the CIA level but in Committee discussions has generally acquiesced in the drift of the Committee's thinking toward multiple centers. DD/S&T is, no doubt, subject to the same parochial temptations as any other Directorate but DD/S&T policies in computing and in other areas have traditionally supported centralization across the Agency; the DD/S&T position on the subject issue is that the economic and technical pressures supporting centralization clearly over-ride political considerations and that the objective of CIA policy on EDP should be centralization at the CIA level. The OBPAM Representative to the Committee has voiced no objection to the majority view of the Committee members.

b. Momentum of Past CIA Centralization Actions:

The momentum of past CIA centralization actions support increasing centralization within the Agency. Major centralization actions by CIA Management in the EDP field are as follows:

1) DD/I Automation Staff (functions, personnel, and slots /50/) centralized into CIA ADP Staff with Agency-wide functions (1961).

2) CIA ADP Staff (including its IBM 7090, 1410, 1401 center) and ADP Division (including its RCA 501, 301 center) centralized into the Office of Computer Services for Agency-wide support (1963).

3) Two NPIC computing facilities centralized into the Information Processing Division for NPIC-wide support (1964).

4) The bulk of DD/P computing has been centralized in RID from the start.

The five-year evolution of OCS into CIA's all-Directorate computing organization is the dominant theme of the above management actions. The Office of Computer Services is now charged with all Headquarters Building computing for three (DD/I, DD/S, and DD/S&T) of the four CIA Directorates. To turn back now toward Directorate structuring of OCS EDP resources will, of course, be to fragment again what has, since the beginning of this decade, grown together.

c. Extra-CIA Pressures on CIA's Top Management:

The substance of BOB and other Department Circulars and of proposed Congressional actions in the EDP field supports the theme of centralization. These external pressures, although of course based on economic considerations, constitute inputs to the "political" climate in which Agency Management functions.

As a specific, the most recent and most authoritative Government Directive in this area (BOB Circular A-71, dated 6 March 1965) includes the following as a responsibility of the Heads of all Executive Agencies:

> "Merger or integration of data systems irrespective of intra-agency or interagency organizational lines, when cost effectiveness in equipment utilization, data systems management, or program accomplishment can be increased."

d. Security:

The Committee has discussed the question of security in connection with centralization of EDP resources. In such context, security becomes an element of the "political" considerations to be considered. It is directly tied to organizational lines and attitudes. This kind of security concept is called "organizational compartmentation" and for the computing function its rule reads: "EDP people inside the organizational boundaries of a Directorate may handle the sensitive materials processed by that Directorate; EDP personnel in a CIA center may not." The distinguishing factor here is the organizational boundary.

Security is a very difficult area to penetrate with the intellect. And, it is often embedded in very strong feelings. A few comments, however, on this security issue as it relates to EDP centralization may be helpful.

1) Issue has already been fully staffed out:

The entire question of handling sensitive materials in the CIA Computer Center arose soon after OCS was formed. As a result, the Executive Director, in Action Memorandum No. A-365, dated 10 March 1964, requested a thorough study of the question. The issue was analyzed in detail and very comprehensive security control procedures were devised for the Agency's central computing facility and for components using the services of OCS. These detailed security procedures were thoroughly coordinated with all Directorates and then formally approved by the Executive Director.*

OCS has the most studied and presumably the tightest physical and procedural security protection of any computing facility in the Agency. The surfacing of this issue at this point in time tends to reduce a very valid area of CIA concern to a polemic anachronism.

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* See Staff Study on Security Compartmentation within OCS, DD/S&T, dated 26 March 1964.

2) The rule of security control:

A basic rule for protection of data might be the following: "Access to sensitive data by the fewest people feasible, in a highly secure area, under tight procedural controls over both data and personnel."

The Agency has invested a great deal of thought, time, and money in assuring that its centralized computing facility fits that rule.

(As for the "Fewest people feasible"--Data processed by computer is in machine-language; not human language. It is translated into human language by the machine as it is printed on the computer's printing device. Computer Operators tend such printing devices and can observe its outputs. From the Agency-wide point of view, there would, of course, be significantly fewer Computer Operators in a fully centralized shop than in localized centers...as pointed out in Paragraph 7 of this statement.)

3) Centralized processing of sensitive data not limited to EDP:

Centralized processing of sensitive data is the pattern in several functional areas in the Agency in addition to computing; to wit: security, finance, personnel, printing services, communications, the Cable Secretariat, etc., which serve as offices of common concern for the processing and control of much, if not all, of the sensitive operational, intelligence, and support data in question in computer processing.

4) In sum, because of all the attention already given this question of data protection in the Agency's centralized computer shop, it seems doubtful that Directorate-level centers would be able to improve appreciably security controls so that 1) fewer people would have access to the data or that 2) less likelihood would exist of releasing data to unauthorized persons.

9. CONCLUSIONS:

The above economic and technical considerations outweigh that portion of the political considerations hostile to continuation and extension of CIA-level centralization policy.

Therefore, CIA should continue its CIA-level centralization policy:

1) As opposed to Directorate-level structuring, centralization will:

...save [redacted] in rentals 25X1

...save 57 ceiling positions

...save 6,000 sq. ft. in the Headquarters Building

(See Table 2)

2) It is technically feasible and is most in harmony with the future trend of the EDP science.

3) It is in harmony with the extra-CIA pressures from BOB and other Departments.

4) It continues to build on what CIA has already built at the cost of past dislocations.

5) Given renewed management support, it is manageable. (Without that support, it is totally unmanageable.)

To reverse directions and go the Directorate route would mean:

1) Splitting up the present CIA-level organization (OCS) into Directorate pieces.

2) Physically dividing the present CIA Computer Center and its peripheral rooms into separate Directorate areas.

3) Building a new computer center for the DD/I.

4) Continued operation of a separate DD/P center.

5) Committing this Agency to all the personnel and hardware and software and space redundancies and inefficiencies pointed out in Paragraphs 6 and 7 above.

6) Impairment to acquisition, training and Career Development of computing personnel.

7) Moving counter to a) the direction increasingly urged by BOB and other government departments, b) the direction of past CIA organizational actions, and c) the direction which the "third-generation" state of the EDP science virtually dictates.

Firm assertion by Top Management that CIA policy should be to support the centralization progression for this Agency's computing resources need not, of course, --and indeed must not-- lead to operationally destructive implementation actions from any quarter. With the clear assertion of Management's policy determination, we can then proceed over time to constructive integration.

The Agency can reasonably proceed toward more effective centralization via the following gradual (phased) program:

1) Issue policy statement now clearly supporting centralization at the CIA level of computing resources but scheduling such centralization in two phases:

Phase I - Centralization of hardware/ operations resources now.

Phase II - Centralization of outlying EDP Systems Design and Job Programming skills after the full completion of Phase I (2 yrs. hence).

2) Centralize over the next few months the day-to-day management and supervision of CIA computer operations (hardware, operators of hardware, and systems programming)--leaving OCS, NPIC, and DD/P equipment in place, pro tem.

3) Physically consolidate all Headquarters hardware at the earliest date possible following the introduction of third generation equipment to the CIA Computer Center.

4) Leave present NPIC, DD/P, and DD/S&T EDP systems design and job programming resources under their present components until full realization of step "3" immediately above is achieved.

NOTE: It is recognized that, although already feasible technically, it may be some years before (if ever) it proves profitable to install the necessary communications facilities between Headquarters [redacted] to permit performing on-line NPIC mensuration computing from the Headquarters Building. Thus, computer operations in [redacted] can be placed under the central computing component but must be operated as a second physical site unless or until adequate communication facilities are installed. 25X1 25X1

A separate CIA-level EDP management policy and control staff?

1) Certain control, policy, liaison, and reporting functions in the computing field must be performed for the Agency.

2) Responsibility for same now resides with the AD/CS. (These Agency-wide "staff" functions had resided with the former CIA ADP Staff from the inception of that Staff and came to OCS with the merger of the ADP Staff into the Office of Computer Services in 1963.)

3) The Committee has talked at length about breaking this function out from OCS and establishing it in the Office of the Director.

4) There is no question but that such "staff" functions must be performed. How extensive they should be and where they should be placed organizationally within the Agency are direct functions of which way Management decides the major organizational question: CIA-level or Directorate-level structuring of this Agency's EDP resources.

(If Management opts to organize its EDP resources by Directorate, a multiple-person staff should clearly be established at the Agency level; if, however, Management determines upon CIA-level centralization of Agency EDP resources, most of these "staff" functions will be inherent to the tasks of that central EDP organization and there will be very little, if anything, a separate staff could more properly do.)

5) Therefore, considerations of this issue (and it is a reasonably simple one) logically must follow determination by Management of the major issue... whether to proceed with the centralization of Agency EDP resources or break-up OCS and provide full EDP resources to each Directorate.

There is a strong need for Agency Management decision now on this EDP organizational question. Whether rightly or wrongly, management resolve on the EDP organizational issue is in full and common question. In the absence of clarification, the ability of our EDP leaders to cooperate or even think constructively about our mutual tasks and objectives is in jeopardy. The direction in which CIA computing resources are to be structured must be set, and quickly, to avoid serious damage to the collective capabilities of this segment of CIA activity.

25X1

DD/S&T Member
CIA ADP Committee

SECRET